



Offering a brief look at the vital research and development contributions made by the Small Business Innovation Research (SBIR) Program in direct support of the Air Force mission.

Air Force SBIR Update



Stephen Guilfoos
Air Force SBIR
Program Manager

Future of Air Force SBIR

by Stephen Guilfoos



Dr. Jacques Gansler, Under Secretary of Defense for Acquisition and Technology, issued a memorandum dated 10 Aug 99 to acquisition officials in each of the services. His memorandum addresses the transition of SBIR-developed technologies into DoD acquisition programs.

The ultimate goal is to make SBIR a more prominent player in program acquisition planning and programming process.

Highlights of Dr. Gansler's memorandum include:

- Ensure each Acquisition Category 1 and 2 program designates a SBIR liaison.
- Ensure that at least 20 percent of the SBIR solicitation topics in FY 2000 include acquisition support. (This percentage goal is to increase to 50 percent by the year 2002.)
- Issue guidance to acquisition program managers to include SBIR as part of on-going program planning, and to give favorable consideration, in the acquisition planning process, for funding of successful SBIR technologies. Each Acquisition Category 1 program, during its milestone decision reviews, should address plans for funding the further development and insertion into the program of SBIR-developed technologies.



SBIR Tech Issues

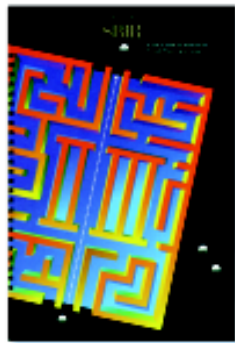
Tech Issues is intended for personnel directly involved in the operation and support of the AF SBIR program.

Program Outreach Efforts

One of the most important aspects of the SBIR program is the effort to publicize the program and encourage small businesses to participate. Overcoming the perception that doing business with the government is too cumbersome and complicated, while benefits remain minimal, is a major problem. An active outreach program directly addresses these perception problems.

Public Law 102-564, the Small Business Research and Development Act, mandates that participating Federal agencies implement outreach efforts necessary to stimulate increased participation of small businesses in Federal Research and Development, particularly socially and economically disadvantaged and women-owned businesses.

In order to fulfill this requirement, DoD has implemented an extensive program via the Internet <http://www.acq.osd.mil/sadbu/sbir> to present information on the SBIR program to small businesses including a program overview, site index, contracting & payments, current solicitation information, other SBIR sites, fast track information, sample proposal section, model contracts section, award information, success stories, upcoming conferences, etc. This site incorporates information concerning the SBIR programs of all agencies within DoD.



AF Outreach Initiatives

The Air Force has implemented an aggressive outreach program. Information concerning the Air Force SBIR Program can be found on the Air Force Research Laboratory (AFRL) home page <http://afrl.af.mil> under the Technology Transfer section. The following information is included:

- Facts and figures
- Brochures detailing the program
- Pre-Solicitation listings from DoD and Air Force



- Links to all AFRL Directorates

- Link to the AF STTR Program

For specific questions or information regarding the Air Force SBIR / STTR Programs contact the following web address www.sbir-hq@afrl.af.mil or call 1-(800) 222-0336.

In addition to the electronic outreach efforts to inform and give small businesses access to the SBIR program, the AF SBIR Management Team has traveled to DoD and state conferences and seminars in 13 different states this year to give presentations about the Air Force program and to answer specific small business questions.

Outreach is a critical ingredient in refining the Air Force SBIR Program to maximize small business participation while continuing to provide the best possible technology to the warfighter.

SBIR Facts & Figures

Air Force SBIR Program Top Ten States — FY 1983 - FY 1998
(All \$ amounts in millions)

State	Phase I Awards	Phase I Dollars	Phase II Awards	Phase II Dollars	Total Dollars
California	1,075	\$80,293,170	582	\$369,822,679	\$450,115,849
Massachusetts	648	\$49,559,263	341	\$216,756,027	\$266,315,290
Ohio	256	\$20,152,176	127	\$83,326,129	\$103,478,305
Virginia	233	\$17,635,544	117	\$73,359,323	\$90,994,867
New York	178	\$12,773,050	92	\$71,796,260	\$84,569,310
Colorado	170	\$13,152,053	95	\$64,164,570	\$77,316,623
New Mexico	130	\$10,009,032	83	\$52,506,550	\$62,515,582
Texas	162	\$12,545,422	70	\$43,652,983	\$56,198,405
New Jersey	111	\$8,188,751	57	\$39,783,253	\$47,972,004
Maryland	144	\$10,553,941	59	\$32,802,060	\$43,356,001

AF SBIR Impact

Innovative Diagnostic System Measures Health of Machinery



"The cost of the SBIR Phase III contract will be only a small fraction of the value of this SBIR project to the Air Force and the Army. While facility and aircraft reliability, availability, and cost avoidance can be readily quantified, the extra safety afforded personnel operating rotary wing aircraft is an intangible that defies quantification.

The initiative and foresight taken by the Army to utilize technology developed initially for the Air Force clearly demonstrates the great utility of the SBIR program."

Dr. Kevin Zysk
SBIR Project Officer
AEDC/DOT

Air Force Requirement

The Air Force, along with the Army and Navy have been seeking a means of automatically measuring the health of engines, gearboxes and rotor systems to permit prediction of catastrophic mechanical failure and open the door to as-required, as opposed to periodic, maintenance.

To accomplish the complicated task, advanced signal processing, data fusion, and advanced decision aids are required to permit after-action health reporting and diagnostics of the various systems.

This kind of innovative system will save lives, eliminate many mechanical problems, and reduce maintenance costs. Potential cost savings for high maintenance equipment alone, such as rotary aircraft, could reach hundreds of millions of dollars each year.

SBIR Technology

ORINCON Corporation was awarded a series of SBIR Phase I efforts from various Air Force, Army and Navy organizations to explore different aspects of the machine health measurement problem.

Early SBIR feasibility studies led to a SBIR Phase II contract with AFRL's Arnold Engineering Development Center (AEDC) in Tennessee. Using the AEDC Propulsion Wind Tunnel Facility for tests of rotating machinery, the company developed and demonstrated its prototype diagnostic equipment.

ORINCON's automated machine health monitoring and fault prediction technology is based on advanced signal processing of vibration data using neural networks. The technique provides real diagnostic solutions by indicating progressive damage in rotating machinery from vibration patterns, and predicting the potential for mechanical failure. A combination of condition indicators with neural-network classifiers feed a knowledge base processor. The processor then provides the field maintenance person with easy-to-understand diagnostic results and recommended corrective action.

Payoff

The Air Force continues to evaluate the exceptional potential for the automated machine health monitoring and fault

prediction technology. Meanwhile, the U.S. Army has provided ORINCON with Phase III (non-SBIR funding) contracts, to date totaling \$6.5 million. These contracts call for development of enhanced vibration monitoring capability for the AH-64 Apache attack and UH-60A Black Hawk utility transport helicopters.

Technology Transfer/Commercialization

This initial use of technology by the military is expected to lead the way to similar applications for all types of rotating machinery including turbine engines, gearboxes and electrical generators. Expected use of this important SBIR technology, by both military and commercial organizations, is expected to be significant.

SBIR Partner

ORINCON Corporation
San Diego, CA

Employees

160



Air Force SBIR Update

Continued from front page...

The Air Force has already taken many steps towards these goals. As I described in our last issue of *SBIR Advantage*, the Air Force turned the SBIR process rightside



up by assigning topic generation to the acquisition community. We've assigned approximately 70 percent of all SBIR topics during the topic generation stage to either the Program Executive Offices (PEOs) or the product, test, or logistics centers. This has the effect of tying our topics directly to the needs and technology requirements of the acquisition and weapon system support

DoD SBIR FY 1998 Annual Survey Summary

Component	SBIR Budget	Number of Topics	Number of Ph. I Proposals	Number of Ph. I Awards	Number of Ph. II Awards
Air Force	\$197,576,700	298	3,285	471	243
Navy	\$108,308,000	172	1,790	229	136
Army	\$100,059,000	169	2,174	200	111
BMDO	\$58,213,208	15	602	178	71
DARPA	\$43,909,267	30	518	44	71

offices. This early ownership provides an excellent opportunity to the acquisition offices to begin their insertion planning for the SBIR technologies.

Next, the Air Force SBIR Program Management Team will be meeting with all the PEOs, product, test, and logistics centers, and AFRL technology directorates SBIR focal points. This group will develop the process for turning the generation of topics into finalized and approved solicitation topics. We will also be utilizing the AFRL sector offices to assure the topics consider the warfighter's perspective.

All of these process improvements and participation by the acquisition community will provide the acquisition program managers with an early involvement to meet all of Dr. Gansler's goals.

I encourage all of our readers to send us their ideas on how we can plus upon this opportunity. As the table above indicates, the Air Force SBIR Program is already the largest in DoD. Working together we can make the Air Force SBIR Program the pre-eminent program in the DoD and the number one program among all the Federal agencies.

